	Application No.	Applicant(s)
Notice of Allowability	09/911,624	ASANO ET AL.
	Examiner	Art Unit	
	Nicholas R. Taylor	2141	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address*--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *2/23/2005*.

2. ☒ The allowed claim(s) is/are *1-8, 10 and 11 (renumbered 1-10)*.

3. ☒ The drawings filed on *7/25/2001* are accepted by the Examiner.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All   b) ☐ Some*   c) ☐ None   of the:

        1. ☒ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of

        Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

DETAILED ACTION

EXAMINER'S AMENDMENT

1.   An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Reginald D. Lucas on 5/20/2005.

The claims are amended as follows:

1.   (currently amended) A packet transmission system comprising:

at least one first host apparatus belonging to a first host group;

at least one second host apparatus belonging to a second host group; and

a router which transfers packets between said first at least one host apparatus and said second at least one host apparatus;

each of said at least one first host apparatus in said first host group comprises,

an insertion unit which inserts in a packet an IP address and a link-layer address of a destination host apparatus of the packet, where said destination host apparatus belongs to said second host group, and

a first transmission unit which transmits said packet in which said IP address and said link-layer address are inserted;

said router comprises,

<u>a plurality of ports each of which is connected to at least one host apparatus;</u>

a storage unit which stores a plurality of identifiers of said plurality of ports and a plurality of subnet addresses of a plurality of subnetworks at a predetermined level in a network hierarchy corresponding to the plurality of ports;

a reception unit which receives a packet transmitted from a source host;

a destination-IP-address extraction unit which extracts a destination IP address from said packet received by said reception unit;

a subnet-address determination unit which determines one of said plurality of subnet addresses of said plurality of subnetworks to which said destination IP address extracted by said destination-IP-address extraction unit corresponds;

a port determination unit which determines a~one of said plurality of ports connected~corresponding to said at least~one of said plurality of subnet addresses determined by said subnet-address determination unit, by referring to said storage unitsecond host apparatus in said second host group based on said IP address inserted in said packet transmitted by said first transmission unit, and

a second~transmission unit which transmits said packet received by said reception unit, from said one of said plurality of ports from said port~determined by said port determination unit, while maintaining a same destination link-layer address as that in said received packet.

2.   (original) A packet transmission system according to claim 1, wherein each of said at least one first host apparatus in said first host group further comprises a unit which determines whether or not said destination host apparatus belongs to a subnetwork at a first predetermined level in a network hierarchy, based on said IP address of the destination host apparatus and a first subnet mask.

3.   (original) A packet transmission system according to claim 1, wherein said router further comprises a unit which determines a subnet address of a subnetwork at a second predetermined level in a network hierarchy to which said destination host apparatus belongs, based on said IP address of the destination host apparatus and a second subnet mask.

4.   (currently amended) A packet transmission system comprising:

a plurality of host apparatuses; and

at least one router which transfers packets between said plurality of host apparatuses;

each of said plurality of host apparatuses comprises,

a first storage unit which stores IP addresses of host apparatuses belonging to a first subnetwork at a first predetermined level in a network hierarchy and link-layer addresses corresponding to the IP addresses,

a first determination unit which determines whether or not a destination host apparatus of a packet belongs to said first subnetwork,

a link-layer address acquisition unit which acquires from said first storage unit a link-layer address of said destination host apparatus based on an IP address of said destination host apparatus when said first determination unit determines that said destination host apparatus belongs to said first subnetwork,

an insertion unit which inserts in said packet said IP address of said destination host apparatus as a destination IP address and said link-layer address of said destination host apparatus as a destination link-layer address, and

a first transmission unit which transmits said packet in which said destination IP address and said destination link-layer address are inserted;

each of said at least one router comprises,

a plurality of ports each of which is connected to at least one host apparatus;

a storage unit which stores a plurality of identifiers of said plurality of ports and a plurality of subnet addresses of a plurality of subnetworks at a predetermined level in a network hierarchy corresponding to the plurality of ports;

a reception unit which receives a packet transmitted from a source host;

a destination-IP-address extraction unit which extracts a destination IP address from said packet received by said reception unit;

a subnet-address determination unit which determines one of said plurality of subnet addresses of said plurality of subnetworks to which said destination IP address extracted by said destination-IP-address extraction unit corresponds;

a port determination unit which determines one of said plurality of ports corresponding to said one of said plurality of subnet addresses determined by said subnet-address determination unit, by referring to said storage unit; and

a transmission unit which transmits said packet received by said reception unit, from said one of said plurality of ports determined by said port determination unit, while maintaining a same destination link-layer address as that in said received packet.

a plurality of ports each of which is connected to at least one host apparatus,

a second storage unit which stores a plurality of identifiers of said plurality of ports and a plurality of subnet addresses of a plurality of second subnetworks at a second predetermined level in a network hierarchy corresponding to the plurality of ports,

a reception unit which receives a packet transmitted from a source host,

a destination-IP-address extraction unit which extracts a destination IP address from said packet received by said reception unit,

a second determination unit which determines one of said plurality of subnet addresses of said plurality of second subnetworks to which said destination IP address extracted by said destination-IP-address extraction unit corresponds,

a third determination unit which determines one of said plurality of ports corresponding to said one of said plurality of subnet addresses determined by said second determination unit, by referring to said second storage unit, and

a second transmission unit which transmits said packet received by said reception unit, from said one of said plurality of ports determined by said third determination unit.

5.   (original) A packet transmission system according to claim 4, wherein said link-layer address is a MAC (Media Access Control) address.

6.   (original) A packet transmission system according to claim 4, wherein said first determination unit uses a first subnet mask in order to determine whether or not said destination host apparatus of said packet belongs to said first subnetwork, said second determination unit uses a second subnet mask in order to determine one of said plurality of subnet addresses of said plurality of second subnetworks to which said destination IP address extracted by said destination-IP-address extraction unit corresponds, and the first and second subnet masks have different lengths.

7.   (original) A packet transmission system according to claim 4, wherein each of said at least one router comprises a discard unit which discards said packet received by said reception unit, as necessary.

8.   (currently amended) A host apparatus for transmitting a packet to a destination host apparatus, comprising:

~~a storage unit which stores IP addresses of host apparatuses belonging to a subnetwork at a predetermined level in a network hierarchy and link-layer addresses corresponding to the IP addresses;~~

~~a determination unit which determines whether or not said destination host apparatus belongs to said subnetwork;~~

~~a link-layer address acquisition unit which acquires from said storage unit a link-layer address of said destination host apparatus based on an IP address of said destination host apparatus when said determination unit determines that said destination host apparatus belongs to said subnetwork;~~

~~an insertion unit which inserts in said packet said IP address of said destination host apparatus as a destination IP address and said link-layer address of said destination host apparatus as a destination link-layer address; and~~

~~a transmission unit which transmits said packet in which said destination IP address and said destination link-layer address are inserted~~

a plurality of ports each of which is connected to at least one other host apparatus;

a storage unit which stores a plurality of identifiers of said plurality of ports and a plurality of subnet addresses of a plurality of subnetworks at a predetermined level in a network hierarchy corresponding to the plurality of ports;

a reception unit which receives a packet transmitted from a source host;

a destination-IP-address extraction unit which extracts a destination IP address from said packet received by said reception unit;

a subnet-address determination unit which determines one of said plurality of subnet addresses of said plurality of subnetworks to which said destination IP address extracted by said destination-IP-address extraction unit corresponds;

a port determination unit which determines one of said plurality of ports corresponding to said one of said plurality of subnet addresses determined by said subnet-address determination unit, by referring to said storage unit; and

a transmission unit which transmits said packet received by said reception unit, from said one of said plurality of ports determined by said port determination unit, while maintaining a same destination link-layer address as that in said received packet.

9.   (cancelled)

10.   (previously presented)   A router for transferring a packet between a plurality of host apparatuses, comprising:

a plurality of ports each of which is connected to at least one host apparatus;

a storage unit which stores a plurality of identifiers of said plurality of ports and a plurality of subnet addresses of a plurality of subnetworks at a predetermined level in a network hierarchy corresponding to the plurality of ports;

a reception unit which receives a packet transmitted from a source host;

a destination-IP-address extraction unit which extracts a destination IP address from said packet received by said reception unit;

a subnet-address determination unit which determines one of said plurality of subnet addresses of said plurality of subnetworks to which said destination IP address extracted by said destination-IP-address extraction unit corresponds;

a port determination unit which determines one of said plurality of ports corresponding to said one of said plurality of subnet addresses determined by said subnet-address determination unit, by referring to said storage unit; and

a transmission unit which transmits said packet received by said reception unit, from said one of said plurality of ports determined by said port determination unit, while maintaining a same destination link-layer address as that in said received packet.

11.   (previously presented) A semiconductor device for use in a router having a plurality of ports each of which is connected to at least one host apparatus, and transferring a packet between host apparatuses, said semiconductor device, when used with said router, makes the router comprise:

a storage unit which stores a plurality of identifiers of said plurality of ports and a plurality of subnet addresses of a plurality of subnetworks at a predetermined level in a network hierarchy corresponding to the plurality of ports;

a reception unit which receives a packet transmitted from a source host;

a destination-IP-address extraction unit which extracts a destination IP address from said packet received by said reception unit;

a subnet-address determination unit which determines one of said plurality of subnet addresses of said plurality of subnetworks to which said destination IP address extracted by said destination-IP-address extraction unit corresponds;

a port determination unit which determines one of said plurality of ports corresponding to said one of said plurality of subnet addresses determined by said subnet-address determination unit, by referring to said storage unit; and

a transmission unit which transmits said packet received by said reception unit, from said one of said plurality of ports determined by said port determination unit, while maintaining a same destination link-layer address as that in said received packet.

12.   (cancelled)

13.   (cancelled)

2.   Claims 1-8, 10 and 11 are allowed.

3.   The following is an Examiner's Statement of Reasons for Allowance:

In interpreting the claims, in light of the specification and the applicant's amendments filed 2/23/2005 and listed in this action, the Examiner finds the claimed invention to be patentably distinct from the prior art of record. The prior art does not teach all of the limitations of the independent claims in combination with the other elements presented.

The prior art of record teaches a network routing device that operates in a bridge-like manner to quickly forward packets to appropriate ports based on the direction from which the packet arrives and the source subnet they contain. When a packet is received, after determining the utilized protocol, a table is consulted to determine if the packet should be forwarded to an attached subnet. If the subnet is not attached, the packet is modified to contain an updated link layer address, and forwarded onwards. A combination with additional art is made to include inserting IP and link-layer addresses in packets originating from the first host device.

However, as per amended claims 1-8, 10, and 11, the prior art and obvious combinations thereof fail to teach maintaining the same destination link-layer address in the routing device's received packets.

4.   Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas Taylor whose telephone number is (571) 272-3889. The examiner can normally be reached on Monday-Friday, 8:00am to 5:30pm, with alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on (571) 272-3880. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3718.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nicholas Taylor
Examiner
Art Unit 2141

RUPAL DHARIA
SUPERVISORY PATENT EXAMINER